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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/782,339 | 02/13/2001 | Masahiko Hirose | 04558/048001 | 7852 |

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EXAMINER

MENON, KRISHNAN S

ART UNIT PAPER NUMBER

1723

DATE MAILED: 07/15/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/782,339

Applicant(s)

HIROSE ET AL.

Examiner

Krishnan S Menon

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1-19 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 1,2,4,5,11,12-15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-010146 in view of Fibiger et al (US 4,909,943).

JP 146 teaches plurality of composite reverse osmosis membrane modules in multistages (figures and specification) with at least one final and one prefinal stage, modules having porous support and polyamide skin layer, selected portion of permeate from prefinal stage supplied to the final stage and rest mixed with the permeate of the final stage as in instant claims 1 and 2; permeated water supplied to the final stage is adjusted to be alkaline at pH about 8 as in instant claims 4 and 5; The salt rejection or prefinal stage at least 99.5% with flux at least 0.3 m³/m² day, when operating at 3.5% salt, pH 6.5 and 5.5 MPA at 25C, as in instant claims 11 and 12; The final stage module has

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at least 99% salt rejection, 0.7 m³/m²/day flux for 0.05% salt water at pH 6.5, 25C and 0.75 MPA as in instant claims 15 and 16.

Re the newly added limitation of claim 1, the polyamide skin layer of the at least one pre-final module comprising bromine atoms, JP 146 does not teach. Fibiger teaches a module comprising bromine atoms in the polyamide discriminating layer (col 4 line 63-col 5 line 7). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Fibiger in the teaching of JP 146 for a module for further improved salt rejection as taught by Fibiger (see abstract).

Re claims 13 and 14, JP-146 in view of Fibiger does not specifically teach the rejection of boron. However, since the membrane of JP-146 in view of Fibiger is the similar to the membrane used by the applicant, similar rejections are expected [inherent property - Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims.]

2. Claims 3, 6-10 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 146 in view of Fibiger as in claim 1 above and further in view of Bray (US 4,046,685).

JP 146 in view of Fibiger teaches all the limitations of the instant claims as in claim 1, and the quality of the feed water as in instant claims 17 and 18, but does not teach splitting the permeate stream from the pre-final stage to two and feeding only one of them to the final stage. Bray (685) teaches (Fig 1,2 and col 5: 4-35) the splitting of the permeate stream to two separate streams, taking first permeate stream, having a lower salt content, from the feed (upstream) end and the second permeate stream having a higher salt content from the retentate end. Bray (685) has a string of modules in a housing, connected in series by the permeate tube, with the feed from one end of the housing and the permeate from the other end. His means for splitting the permeate stream is blocking the through passage in the permeate tube link at a convenient location inside the housing so that the two permeate streams have a substantially different salt content. The ratio of the salt content in Bray's teachings is 2:1 (Fig 2).

It would be obvious to one of ordinary skill in the art at the time of invention to use the Bray (685) teachings in the teaching of JP-146 in view of Fibiger to split the permeate flow from a pressure vessel having a string of modules and then feed only that part of the split flow which has the higher salt concentration to the next/final reverse osmosis membrane stage to "advantageously employ the apparatus for a multistage process for converting sea water to potable water" (see Bray abstract).

Re claim 19, the boron concentration in the permeated water would be <1 ppm, since boron rejection by the membrane used and the system structure are similar to that of the applicant's (inherent property).

Response to Arguments

Applicant's arguments with respect to instant claims have been considered but are moot in view of the new ground(s) of rejection.

35 USC 103 (a) Rejections based on EP-1 136 116 A1 are withdrawn , since the applicant has an earlier filing date than the publication date of this reference. Therefore, this action is made non-final.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Krishnan Menon
Patent Examiner
July 11, 2003

Walker
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